## Pat nt claims

1. Digital signal processing receiver for analyzing an optical signal, in particular in a terabit optical network, comprising a receiver input for receiving the optical signal, a photo diode, an analog-to-digital conversion unit, and a DSP processing unit,
wherein
that the DSP receiver comprises a splitting unit splitting the optical signal received by the receiver input and feeding the split parts into at least two waveguide branches, that at least one waveguide branch comprises an optical filtering element, that each waveguide branch is fed onto a separate photo diode, that the signal of each photo diode is fed into a separate ADC unit, and that the signal of each ADC unit is fed into the DSP processing unit.

2. DSP receiver according to claim 1, wherein each waveguide branch comprises a different optical filtering element.

3. DSP receiver according to claim 1, wherein the optical filtering element(s) comprise chromatic dispersion elements and/or polarization filters and/or spectral filters.

4. DSP receiver according to claim 1, wherein the DSP processing unit comprises an application specific integrated circuit and/or a field programmable gate array circuit.

5. DSP receiver according to claim 1, wherein an additional optical filtering element is arranged between the receiver input and the

splitting unit.

6. Method for recovering an optical signal with a DSP receiver according to claim 1,
wherein by the following steps:
a) the optical signal is split into at least two branches;
b) at least one split optical signal undergoes a filtering procedure;
c) the split optical signals are detected and converted into split digital signals;
d) the split digital signals are analyzed in order to recover information of the optical signal.

7. Method according to claim 6, wherein the information is a recovered electrical data signal modulated onto the optical signal.

8. Method according to claim 6, wherein the information is likelihood numbers for the probability of 0 and 1 bits carried by the optical signal.

9. Method according to claim 8, wherein the analysis of the split optical signals uses a MAP algorithm.

10. Software program for performing the method according to claim 6.